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Left-Side HOV Direct Access Connections

I. Introduction

A. Purpose

To establish policies that allow the Washington State Department of Transportation (WSDOT) to construct left-side HOV direct access connections and to modify policies regarding speed change lanes for left-side HOV direct access connections.

B. Background

In April 1998, WSDOT published a draft *HOV Direct Access Design Guide* (HOV Guide) that gives guidance for facilities that provide direct access for high occupancy vehicles (HOVs) between an HOV lane on a freeway and a facility off that freeway. The HOV Guide was distributed for immediate use on all HOV direct access connections. However, the *Design Manual* discussion on HOV direct access was not changed to refer to the HOV Guide. Therefore, II.A. replaces the *Design Manual* discussion on HOV direct access with a reference to the HOV Guide.

As the preferred location of an HOV lane is the leftmost lane, the HOV Guide gave additional requirements for ramps on the left. However, the HOV Guide did not change the *Design Manual* policy that all ramps are required to be on the right. Therefore, II.B. and II.C. establish a policy to allow HOV only connections on the left.

The acceleration lane lengths established by the draft *HOV Direct Access Design Guide* for connections on the left were calculated based on the acceleration of a 60 ft bus. This resulted in lengths from approximately 1.5 to 3 times the lengths given in the *Design Manual*. In the confined urban areas where the HOV direct access ramps are being constructed, the added length for the full HOV acceleration lane has proven to be difficult and expensive to provide. However, by using a lower freeway speed to calculate the acceleration length to the beginning of the gap acceptance length, the bus will be able to accelerate to a minimum speed before reaching the gap acceptance length. Acceleration can continue in the gap

acceptance length before merging must begin. Therefore, the acceleration length for left-side HOV on-connections can be shortened as given in II.D.

The deceleration lengths given in the draft *HOV Direct Access Design Guide* for left-side off-connections are based on a lower rate of deceleration for passenger comfort. This also has resulted in somewhat longer lengths than required by the *Design Manual*. By using a deceleration length based on a lower speed, but maintaining the minimum *Design Manual* deceleration length, adequate length will be provided for comfortable deceleration during congested periods when speeds are lower. When speeds are higher, sufficient length will be provided for a higher, but safe, rate of deceleration. Therefore, the deceleration length for left-side HOV off-connections can be shortened as given in II.E.

C. Suppression

Design Letter of Instruction, *Left-Side HOV Direct Access Connections*, dated August 30, 1999

D. References

Design Manual, M 22-01

HOV Direct Access Design Guide (HOV Guide), Draft M 22-98

E. Effective Date and Term

These rules and procedures are effective on the date of this letter and will expire when the changes are incorporated in the referenced manuals.

II. Instructions

A. Revise *Design Manual* Chapter 1050

Replace the three existing paragraphs in 1050.06(5), Direct Access Connections, with the following:

Design HOV direct access connections in accordance with the <i>HOV Direct Access Design Guide</i> , Draft M 22-98.
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Delete Figures 1050-5a, 5b, and 5c.

B. Revise *Design Manual* Chapter 940

Revise the first sentence of the first paragraph of 940.04(1) to read:

All freeway exits and entrances, except HOV direct access connections, are to connect only on the right of through traffic.

Add the following between the first and second paragraphs of 940.04(1):

HOV direct access connections may be constructed on the left of through traffic when they are designed in accordance with the *HOV Direct Access Design Guide*.

Add the following bullet item to the bulleted list in 940.09:

- For HOV direct access connections on the left, include the statement that the connection will be used solely by HOVs or will be closed.

C. Revise Draft *HOV Direct Access Design Guide* Chapter 1

Delete the first paragraph of 1.03 and replace it with:

When any portion of a proposed HOV direct access facility design does not conform to the guidance in this guide or the *Design Manual*, an approved deviation is required.

Add the following to the end of the third paragraph of 1.04:

For left-side connections, include the commitment that the connection will be used solely by HOVs or will be closed.

Add the following to the end of Chapter 1:

1.05 Left-side Connections

Left-side connections meet geometric design criteria when they serve HOVs only and connect to an HOV lane. The higher traffic volumes associated with a general purpose connection are not acceptable on a left-side connection designed for the lower HOV-only volumes. If the demand for an HOV direct access decreases to the point that a connection is no longer desirable, the connection must be closed.

D. Revise Draft *HOV Direct Access Design Guide* Chapter 5

Add the following to 5.07

(5) Design of Urban On-Connections

Design left-side HOV direct access on-connections in urban areas as follows:

1. Use the parallel design for all on-connections.
2. Add the Gap Acceptance Length for Parallel On-Connections (Figure 5-2) with a highway speed of 60 mph to the acceleration length.
3. Use Acceleration Length for Buses (Figure 5-4) with a 60 mph freeway speed for acceleration length.

(6) Design of Rural On-Connections

Design left-side HOV direct access on-connections in rural areas in accordance with the *HOV Direct Access Design Guide* using a freeway design speed as determined using *Design Manual* Chapter 440

E. Revise Draft *HOV Direct Access Design Guide* Chapter 5

Add the following to 5.08

(4) Design of Urban Off-Connections

Design left-side HOV direct access off-connections in urban areas as follows:

1. Either the taper or the parallel design may be used.
2. Use the longer deceleration length of; the Deceleration Length for Buses (Figure 5-6) with a 60 mph freeway speed, or the Minimum Deceleration Length (*Design Manual* Figure 940-10) with a 70 mph freeway speed.

(5) Design of Rural Off-Connections

Design left-side HOV direct access off-connections in rural areas in accordance with the *HOV Direct Access Design Guide* using a freeway design speed as determined using *Design Manual* Chapter 440.